

IN THE CLAIMS

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please AMEND the claims according to the following:

1. (CURRENTLY AMENDED) A two-dimensional code extraction method comprising:

inputting image data;

scanning said input image data in a square block unit of MXN pixels (M and N are positive integers);

detecting blocks that satisfy specific conditions from said scanned blocks;

detecting a plurality of regions of blocks~~block-regions~~ corresponding to a respective plurality of two-dimensional codes, each ~~block-region of blocks~~ comprising a number of neighboring and contiguous blocks from among said detected blocks that satisfy specific conditions from said scanned blocks;

detecting one or more regions of two-dimensional code~~regions codes~~, each region of a two-dimensional code containing a corresponding detected region of blocks~~block-region~~ comprising a predetermined number of the neighboring and contiguous blocks as a two-dimensional code; and

extracting one or more two dimensional codes from among the detected plurality of one or more regions of two-dimensional code~~regions codes~~ that have more than a predetermined number of the neighboring and contiguous blocks.

2. (ORIGINAL) The two-dimensional code extraction method according to claim 1, wherein a block that includes a ratio of white pixels and black pixels that falls within a specific range is detected as a block satisfying said specific conditions.

3. (PREVIOUSLY PRESENTED) The two-dimensional code extraction method according to claim 1, wherein a block that includes a ratio between transition points of pixels within horizontal lines or vertical lines of the block and a total number of pixels of the block that falls within a specific range is detected as a block satisfying said specific conditions.

4. (PREVIOUSLY PRESENTED) The two-dimensional code extraction method according to claim 1, wherein a block in which variation of a vertical or horizontal projection of black pixels included in each line in the block falls within a specific range is detected as a block satisfying said specific conditions.

5. (CURRENTLY AMENDED) The two-dimensional code extraction method according to claim 1, further comprising:

detecting a region of a two-dimensional code region comprising a maximum number of detected neighboring and contiguous blocks from among the detected one or more regions of two-dimensional code regions.

6. (CURRENTLY AMENDED) The two-dimensional code extraction method according to claim 1, wherein the detecting the one or more regions of two-dimensional code regions further comprises:

scanning a detected block-region region of blocks, from a point within said block-region of blocks, block by block having a predetermined size upward, downward, to the right and to the left of said point;

detecting a position such that a number of black pixels within said scanned block is less than a predetermined value; and

extracting a square area including said detected position as thea region of a two-dimensional code region that contains a region of blocks block-region, for each of the plurality of detected regions of blocks block-regions.

7. (PREVIOUSLY PRESENTED) A two-dimensional code extraction method according to claim 1, further comprising:

calculating average distance between pairs of black pixels within said scanned blocks; and

extracting a scanned block as a detected block satisfying said specific conditions, when a determination is made that said calculated average distance exceeds a predetermined value.

8. (CURRENTLY AMENDED) The two-dimensional code extraction method according to claim 1, further comprising:

determining an angle of inclination of the input image or the angle of inclination of a two-dimensional code based upon a region of a two-dimensional code region-containing the detected region of blocksblock-region comprising the predetermined number of the neighboring and contiguous blocks as the two-dimensional code; and

correcting the angle of inclination, if the angle of inclination exceeds a specific value.

9. (CURRENTLY AMENDED) The two-dimensional code extraction method according to claim 1, further comprising:

detecting a region of a two-dimensional code region-comprising a maximum number of detected contiguous blocks from among the detected regions of two-dimensional code regionscodes.

10. (CURRENTLY AMENDED) A computer-readable medium storing a program which, when executed by a computer, causes the computer to execute a two-dimensional code extraction method comprising:

inputting image data;

scanning said input image data in a square block unit of MxN pixels (M and N are positive integers);

detecting blocks that satisfy specific conditions from said scanned blocks;

detecting a plurality of regions of blocksblock-regions corresponding to a respective plurality of two-dimensional codes, each block-region of blocks comprising a number of neighboring and contiguous blocks from among said detected blocks that satisfy specific conditions from said scanned blocks;

detecting one or more regions of two-dimensional code regionscodes, each region of a two-dimensional code containing a corresponding detected region of blocks block-region comprising a predetermined number of the neighboring and contiguous blocks as a two-dimensional code; and

extracting one or more two-dimensional codes from among the detected plurality of one or more regions of two-dimensional code regions codes that have more than a predetermined number of neighboring and contiguous blocks.

11. (ORIGINAL) The computer-readable medium according to claim 10, wherein a block that includes a ratio of white pixels and black pixels that falls within a specific range is detected as a block satisfying said specific conditions.

12. (PREVIOUSLY PRESENTED) The computer-readable medium according to claim 10, wherein a block that includes a ratio between transition points of pixels within horizontal lines or vertical lines of the block and a total number of pixels of the block that falls within a specific range is detected as a block satisfying said specific conditions.

13. (PREVIOUSLY PRESENTED) The computer-readable medium according to claim 10, wherein a block in which variation of a vertical or horizontal projection of black pixels included in each line in the block falls within a specific range is detected a block satisfying said specific conditions.

14. (CURRENTLY AMENDED) The computer-readable medium according to claim 10, further comprising:

detecting a region of a two-dimensional code region comprising a maximum number of detected neighboring and contiguous blocks from among the detected one or more regions of two-dimensional code regions codes.

15. (CURRENTLY AMENDED) The computer-readable medium according to claim 10, wherein the detecting the one or more regions of two-dimensional code regions codes further comprises:

scanning a detected block region region of blocks, from a point within said block region of blocks, block by block having a predetermined size upward, downward, to the right and to the left of said point;

detecting a position such that a number of black pixels within said scanned block is less than a predetermined value; and

extracting a square area including said detected position as thea region of a two-dimensional code region that contains a block-region of blocks, for each of the plurality of detected regions of blocksblock-regions.

16. (PREVIOUSLY PRESENTED) The computer-readable medium according to claim 10, further comprising:

calculating average distance between pairs of black pixels within said scanned blocks; and

extracting a scanned block as a detected block satisfying said specific conditions, when a determination is made that said calculated average distance exceeds a predetermined value.

17. (CURRENTLY AMENDED) The computer-readable medium according to claim 10, further comprising:

determining an angle of inclination of the input image or the angle of inclination of a two-dimensional code based upon a region of a two-dimensional code region-containing the detected block-regionregion of blocks comprising the predetermined number of the neighboring and contiguous blocks as the two-dimensional code; and

correcting the angle of inclination, if the angle of inclination exceeds a specific value.

18. (CURRENTLY AMENDED) The computer-readable medium according to claim 10, further comprising:

detecting a region of a two-dimensional code region-comprising a maximum number of detected contiguous blocks from among the detected regions of two-dimensional code regionscodes.

19. (CURRENTLY AMENDED) An apparatus extracting two-dimensional code from an input document, comprising:

an image scanner scanning the document, and outputting input image data; and

a programmed computer processor connected to said image scanner and controlling the apparatus according to a two-dimensional code extraction process, comprising:

scanning said input image data in a square block unit of MxN pixels (M and N are positive integers),

detecting blocks that satisfy specific conditions from said scanned blocks,
detecting a plurality of regions of blocks~~block-regions~~ corresponding to a
respective plurality of two-dimensional codes, each ~~block-region of blocks~~ comprising a number
of neighboring and contiguous blocks from among said detected blocks that satisfy specific
conditions from said scanned blocks,

detecting one or more regions of two-dimensional code-regions~~codes~~, each
region of a two-dimensional code containing a corresponding detected region of blocks~~block~~
region comprising a predetermined number of the neighboring and contiguous blocks as a two-
dimensional code, and

extracting one or more two-dimensional codes from among the detected plurality
~~of one or more regions of two-dimensional code-regions~~codes that have more than a
predetermined number of the neighboring and contiguous blocks.

20. (PREVIOUSLY PRESENTED) The apparatus extracting two-dimensional code
according to claim 19, further comprising means for reading information from a computer-
readable medium containing computer software for said two-dimensional code extraction
process.